

# **NATURAL AREA RESERVES SYSTEM**

---

REPORT NO. 1

JULY 1987

PLANT SURVEY OF THE SUMMIT PLATEAU  
MT. KA'ALA NATURAL AREA RESERVE

Department of Land and Natural Resources

State of Hawaii



A



B

Fig. 3. Two views of the wet shrub forest. A. In the foreground is a prominent 'ohi'a-lehua shrub. Towering over the shrub canopy in the background are lapapa trees. B. The edge of the shrub forest as it extends down the road embankment to the primarily nonnative, grassy vegetation of the roadside.

apparently aggressive, thicket-forming weed is having a destructive effect on the native ecosystem. The 16 other nonnative species infesting the shrub forest are not as threatening.

Where the ground is saturated with standing water, the forest is more open and its height is only 3 to 6 feet. The glabrous form of 'ohi'a-lehua, Metrosideros collina ssp. polymorpha var. glaberrima, is more abundant. Some plants of other species display near bog type features. An introduced species of a bog moss (Sphagnum) carpets water-logged areas of the bog trail.

Drier portions of the bog trail tend to have narrow-leaved carpetgrass (Axonopus affinis) and Hilo grass (Paspalum conjugatum), both nonnatives. Other nonnative grasses usually present along the trail are broomsedge (Andropogon virginicus) and Glenwood grass (Sacciolepis indica). The old helicopter pad is an extensive grass-covered area.

#### ROADSIDE VEGETATION

This nonnative plant community (Fig. 3) is the product of its location and the periodic cutting and trimming it is subjected to during roadside maintenance. In addition to its roadside occurrence, this cultivated vegetation type borders the radio tower site, helicopter pad, and radar dome facility. These drastically altered habitats support 84 species, of which only 20 are native. All of the native species except for one, a sedge (Pyreus polystachos), are part of the shrub forest as well. Among the 64 nonnative species, 13 are also in the native shrub forest.

It is an open vegetation composed of scattered shrubs and ferns and a grass ground cover. There are 21 species of grass, all nonnative. Kikuyugrass (Pennisetum clandestinum) and narrow-leaved carpetgrass (Axonopus affinis), which were probably planted, are being nurtured for their ground cover features. Tall festucoid grass species include orchardgrass (Dactylis glomerata), Italian ryegrass (Lolium multiflorum), foxtail fescue (Vulpia megalura), and smooth brome (Bromus inermis).

Gouging of the ground by feral pigs, apparently as they grub for earthworms, is especially evident in the grassy, open

vegetation along the radio tower site and the road leading to it.

### NONNATIVE SPECIES

The summit plateau's 67 nonnative species are distributed as follows: 3 are only in the shrub forest, 51 are only in the roadside vegetation, and 13 occur in both the shrub forest and roadside vegetation. The 16 nonnative species that inhabit the shrub forest are generally in altered or disturbed areas, such as the trails, the old helicopter pad, and in pig-damaged spots.

Blackberry (Rubus penetrans), the most invasive of the nine species, has already encroached into sizeable areas of the plateau (Fig. 11). Its adaptation to the wet and cool environment of the summit plateau appears to equal that of the native plants. Two other species in particular, clidemia (Clidemia hirta) and waiawi (Psidium cattleianum), although not present in large numbers, may be capable of spreading and becoming as serious a management problem as blackberry.

While the nonnative plant infestations along trails, roads, and other developed areas are the result essentially of human activities, the nonnative growth within the shrub forest can be related to the presence of feral pigs. Disruption of the plant cover and soil by the grubbing activity of pigs creates a colonizing opportunity for nonnative plant species. Moreover, the pigs themselves can be the carrier of the colonizing seed. No attempt was made to survey and assess the impact of the feral pig population--both endeavors are outside the scope of this report.

Nine of the 67 nonnative species stand out as being the most threatening to the stability and survival of the shrub forest ecosystem. Selection of the nine species depended on in situ observations, on field experience elsewhere, and to a limited extent on literature review.

#### Clidemia hirta (clidemia) MELASTOMATACEAE

This is a perennial shrub, 3 to 6 feet tall, that produces an edible berry with numerous minute seeds. A native of tropical

America, it was first seen on O'ahu in 1952 (Haselwood and Motter 1966). It grows well in moist habitats above an elevation of 900 feet, where it readily colonizes disturbed areas.

DISTRIBUTION (Fig. 4). A group of clidemia seedlings was located outside of the reserve boundary along the ridge trail where pigs had dug the ground cover and soil. The ridge trail had an earlier seedling population that was uprooted in May 1985 (Karen Asherman, pers. comm.).

GENERAL CONDITION. The plants were small, 4 to 10 inches tall, with no flowers or fruit. They occurred in seven clusters, each with three to five plants that displayed fair to vigorous growth. Clidemia appears to be well-suited to growing on the summit plateau.

ACTION TAKEN. The seven clusters of clidemia were eradicated in August and September of 1985.

RECOMMENDATION. The bog and ridge trails, and accessible pig-damaged areas should be monitored every six months.

Eupatorium adenophorum (Maui pa-makani)  
COMPOSITAE

A perennial shrub that grows up to 6 feet tall, this weed is a native of Mexico. After its introduction on Maui about 1900 (Degener 1930), it has become widespread on other islands. It can grow in dry to moist conditions from sea level to high elevations.

DISTRIBUTION (Fig. 5). It is present in roadside, drainage, and grassy areas, and in adjacent sections of the shrub forest where the vegetation and ground had been disturbed.

GENERAL CONDITION. The plants were up to 2 feet tall with no flowers or fruits. Nearly all had prominent insect galls, the apparent cause of dead or dying stems.

RECOMMENDATION. No recommendation at this time. Two species of tephritid gall flies have been introduced to control the growth of this weed. One of them (Procecidochares utilis) has substantially reduced the growth of Maui pa-makani, especially in dry regions (Hawai'i Department of Agriculture 1979, Gardner and Davis 1982). One or both gall fly species seem to be affecting the growth of pa-makani at Mt. Ka'ala.

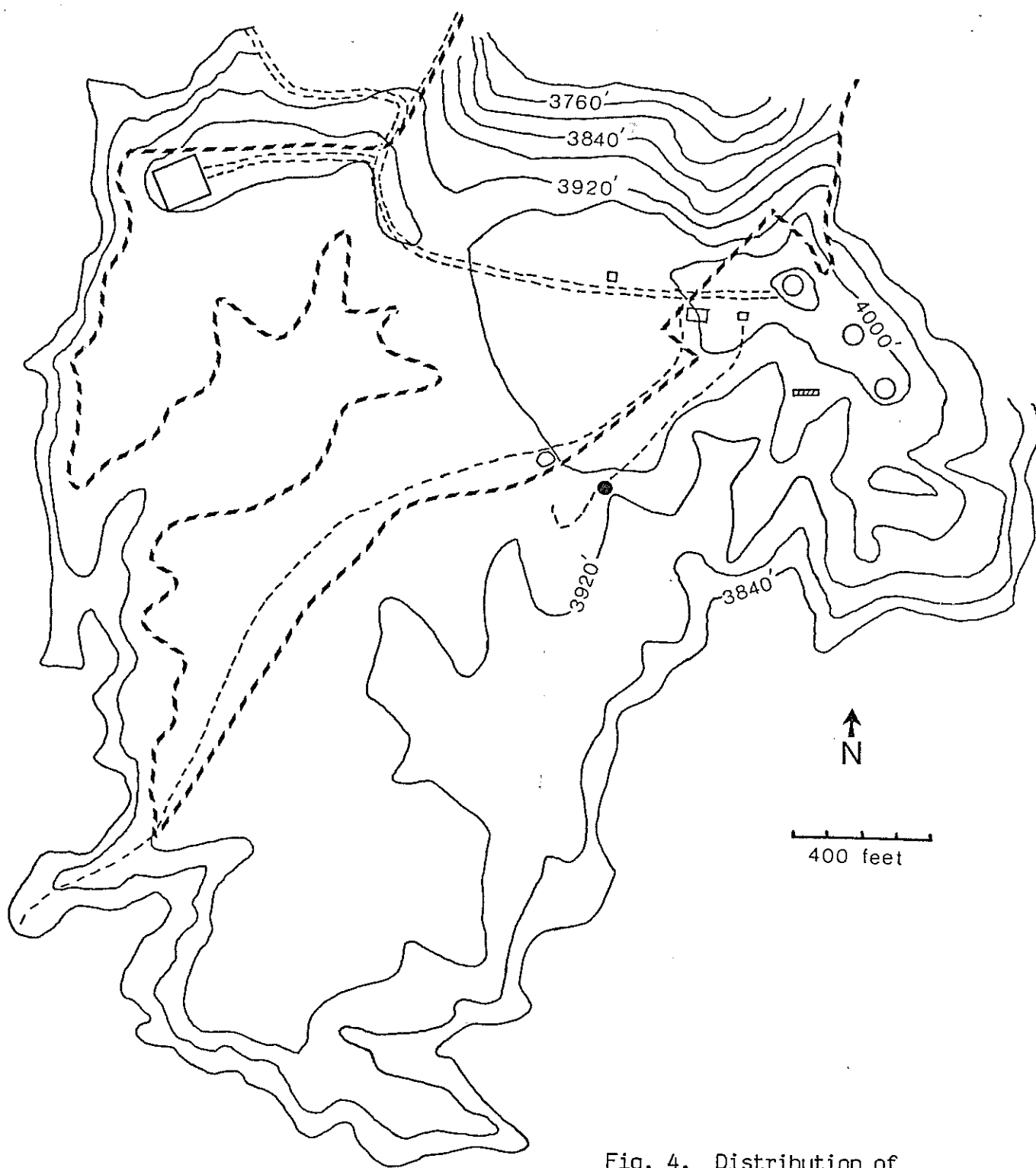


Fig. 4. Distribution of  
● Clidemia hirta.

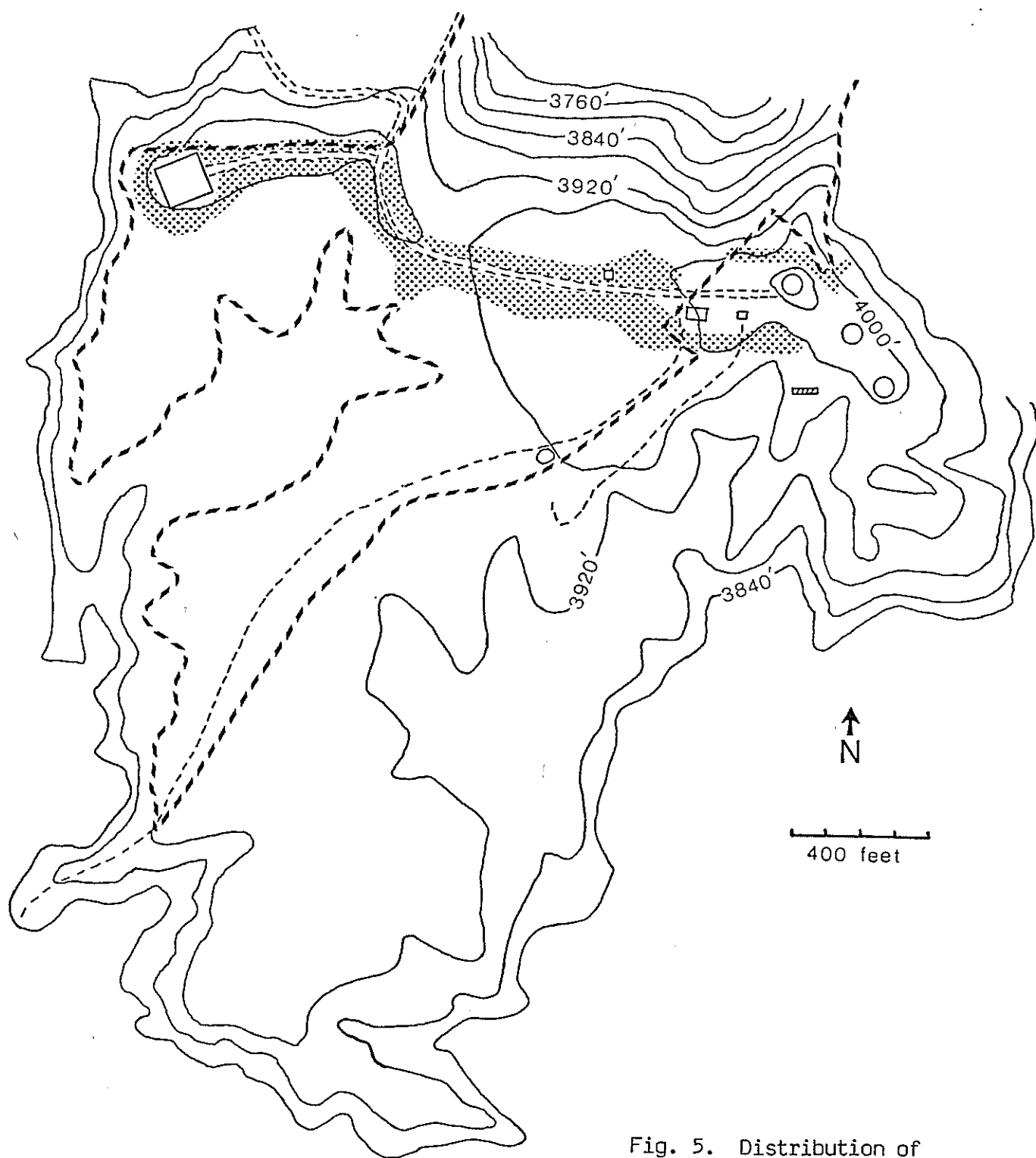


Fig. 5. Distribution of *Eupatorium adenophorum*.



Eupatorium riparium (Hamakua pa-makani)  
COMPOSITAE

This perennial shrub, which can be up to 5 feet tall, is a native of Mexico. Perhaps introduced as an ornamental, it became evident as a weed on the island of Hawai'i by 1926 (Degener 1930). It occurs in moist to wet habitats up to an elevation of about 4,000 feet.

DISTRIBUTION (Fig. 6). Not as widely distributed as E. adenophorum, it is present in grassy areas around the radio tower site and helicopter pad.

GENERAL CONDITION. The plants were only 6 to 8 inches tall, with no flowers or fruits. All of the plants had insect galls, which may be the reason for their fair to poor appearance.

RECOMMENDATION. No recommendation at this time. Elsewhere in Hawaii a fungus (Cercospora ageratinae) and two insects (Oidaematophorus sp. and Procecidochares alani) have been effectively controlling the growth of E. riparium (Hawai'i Department of Agriculture 1979, Gardner and Davis 1982).

Leptospermum scoparium (tea tree)  
MYRTACEAE

This is an aromatic shrub or small tree that ranges 3 to 20 feet in height. A native of New Zealand and Australia (Neal 1965), it was present on Lana'i as early as 1927 (Hawai'i Department of Agriculture 1979). It grows in semi-dry to moist situations at elevations of 900 to 4,000 feet.

DISTRIBUTION (Fig. 7). A 6-foot tall plant grew next to the bog trail and a smaller plant, only a foot tall, was at the side of the road just outside of the reserve.

GENERAL CONDITION. Both plants displayed vigorous growth. There were no flowers or fruits.

ACTION TAKEN. Both plants were removed in August 1985.

RECOMMENDATION. There should be regular monitoring especially of open areas. If left to itself, Leptospermum can become a major infestation.



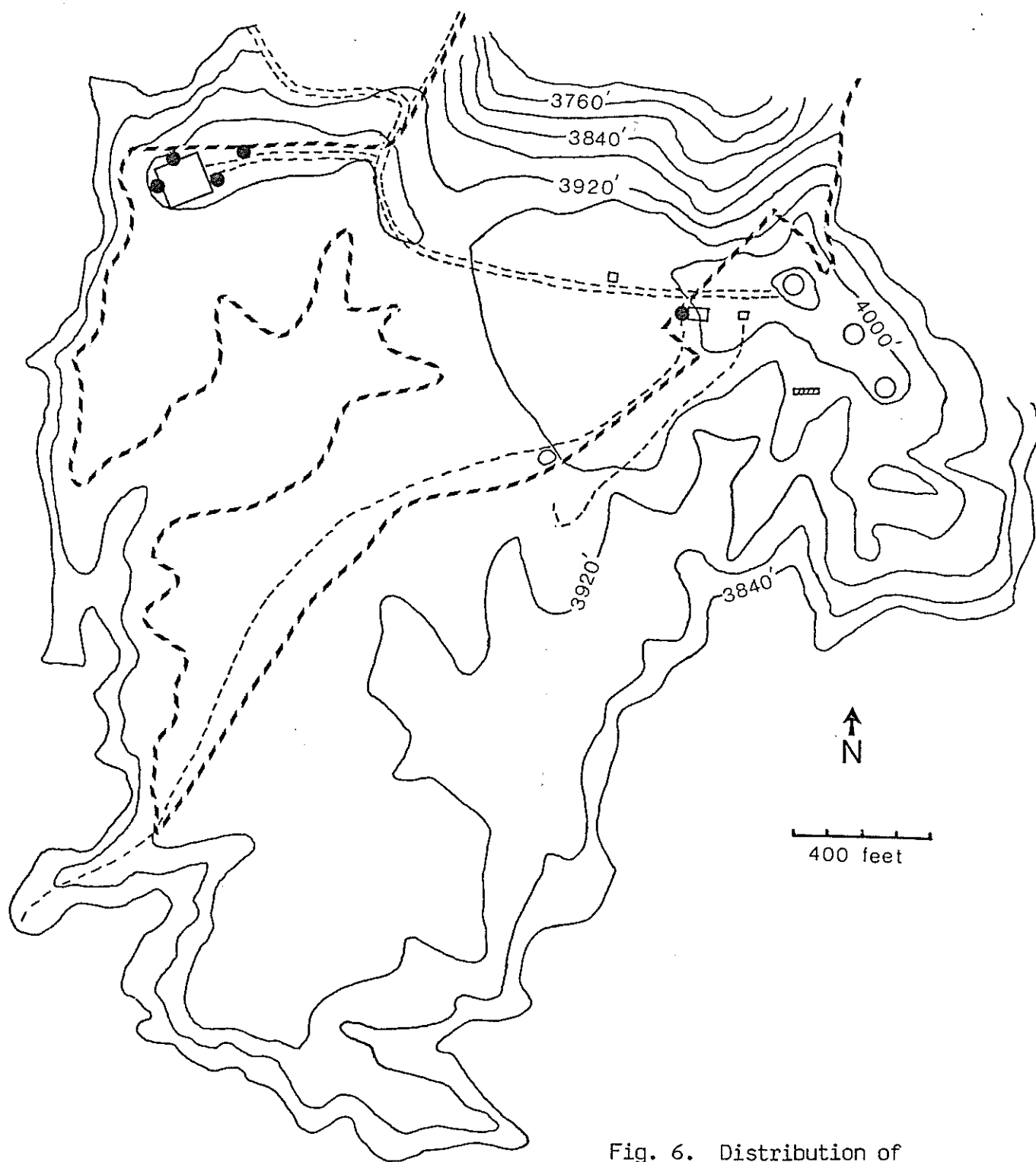


Fig. 6. Distribution of  
● *Eupatorium riparium*.

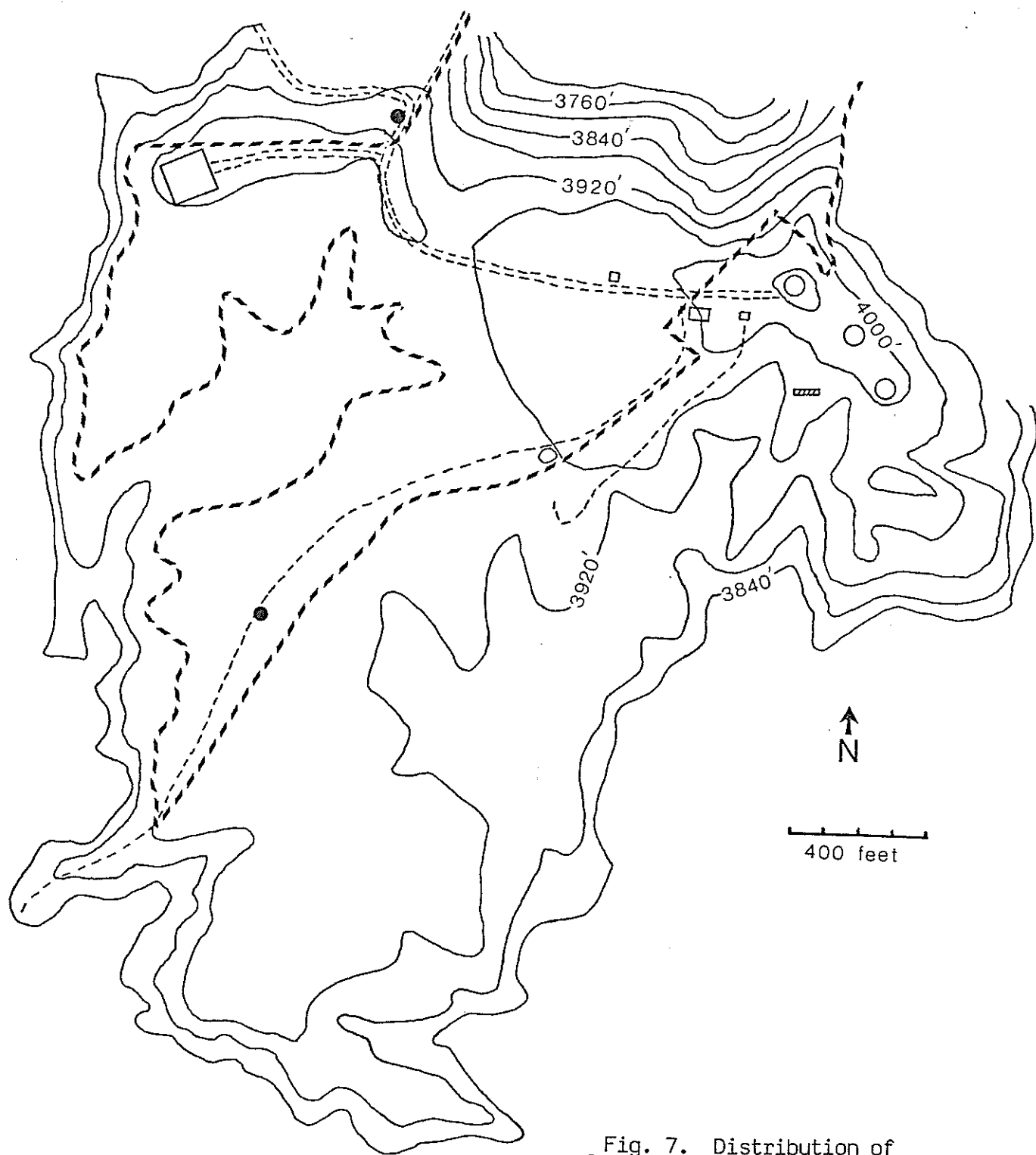


Fig. 7. Distribution of  
● *Leptospermum scoparium*.

Leucaena leucocephala (koa haole)  
LEGUMINOSAE

Koa haole can be a shrub or small tree up to 18 feet tall. A native of tropical America, it was introduced to Hawai'i at least prior to 1888 probably as a forage plant for cattle. It can form dense thickets in dry to moist areas from sea level to 2,500 feet elevation.

DISTRIBUTION (Fig. 8). One plant, about 3 feet tall, was in an uluhe (Dicranopteris linearis) thicket along the road to the radar dome site. Another smaller plant was on a pig trail in a grassy area by the radio tower road.

GENERAL CONDITION. The larger plant had many flowering heads but no pods. It was flowering even though its vegetative condition was poor. The summit may be too cold and wet for this species.

ACTION TAKEN. Both plants were removed in August 1985.

RECOMMENDATION. There should be regular monitoring, especially at the sites where they were first found.

Pennisetum clandestinum (kikuyugrass)  
GRAMINEAE

GENERAL INFORMATION. An aggressive perennial, this sod-forming grass is a native of tropical Africa. It was brought over in 1925 for ground cover and forage use (Hosaka 1958). It grows well in moist to wet areas. Although in the Islands it may be a desirable forage grass, on the continent it is labeled a noxious weed by the U. S. Department of Agriculture (Gardner and Kageler 1983).

DISTRIBUTION (Fig. 9). This plant, which was probably planted, is nurtured at the roadsides, helicopter pad, drainage channels, and communication facilities. It is encroaching into the shrub forest from the south side of the helicopter pad next to a heavy infestation of blackberry.

GENERAL CONDITION. Displaying vigorous growth, kikuyugrass appears to be well-adapted to the summit habitat.

RECOMMENDATION. Permanent monitoring stations should be established to detect the rate and extent of encroaching grass cover. The monitoring data will be useful in determining what control measures to apply and how often.

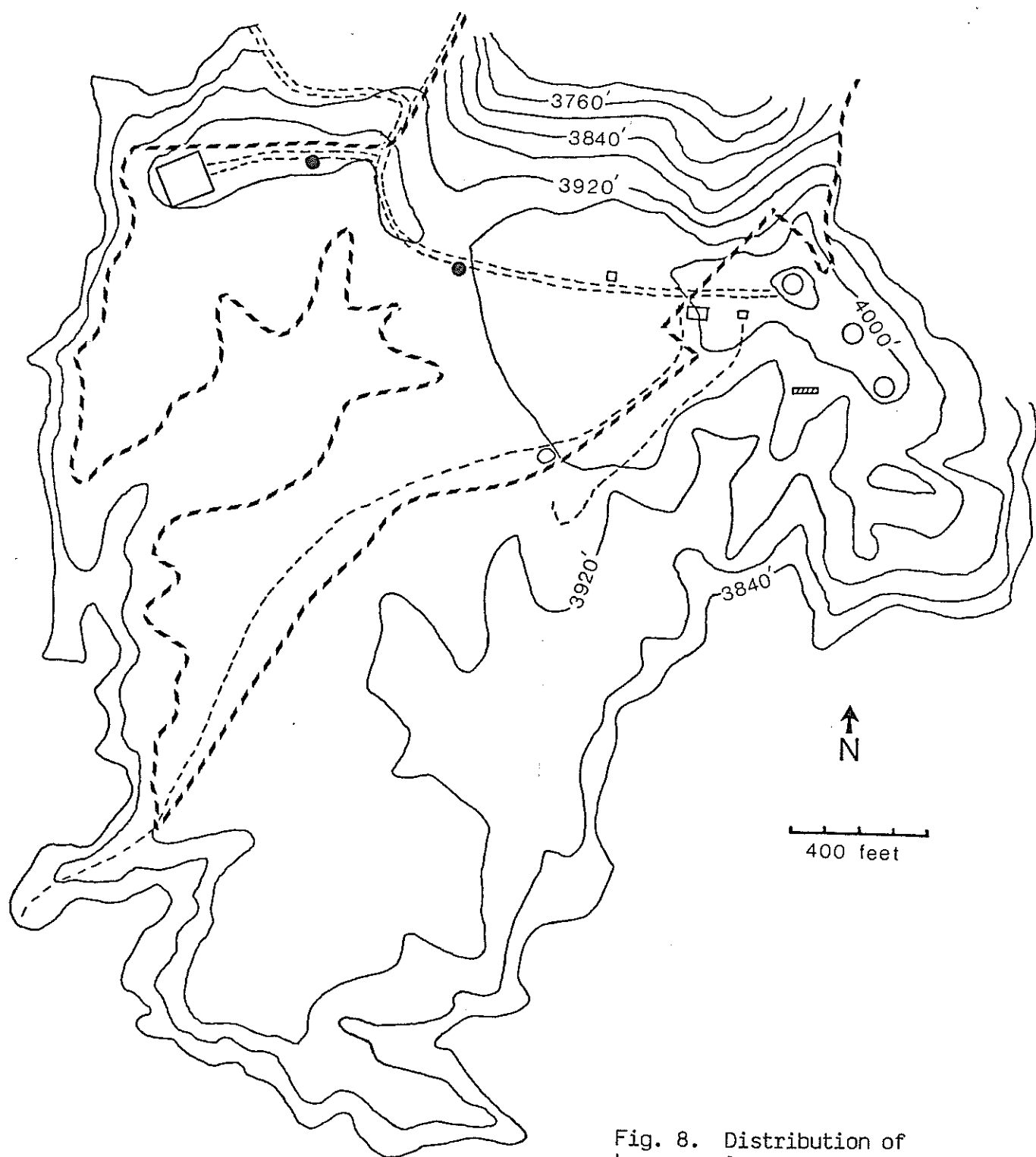


Fig. 8. Distribution of  
● *Leucaena leucocephala*.

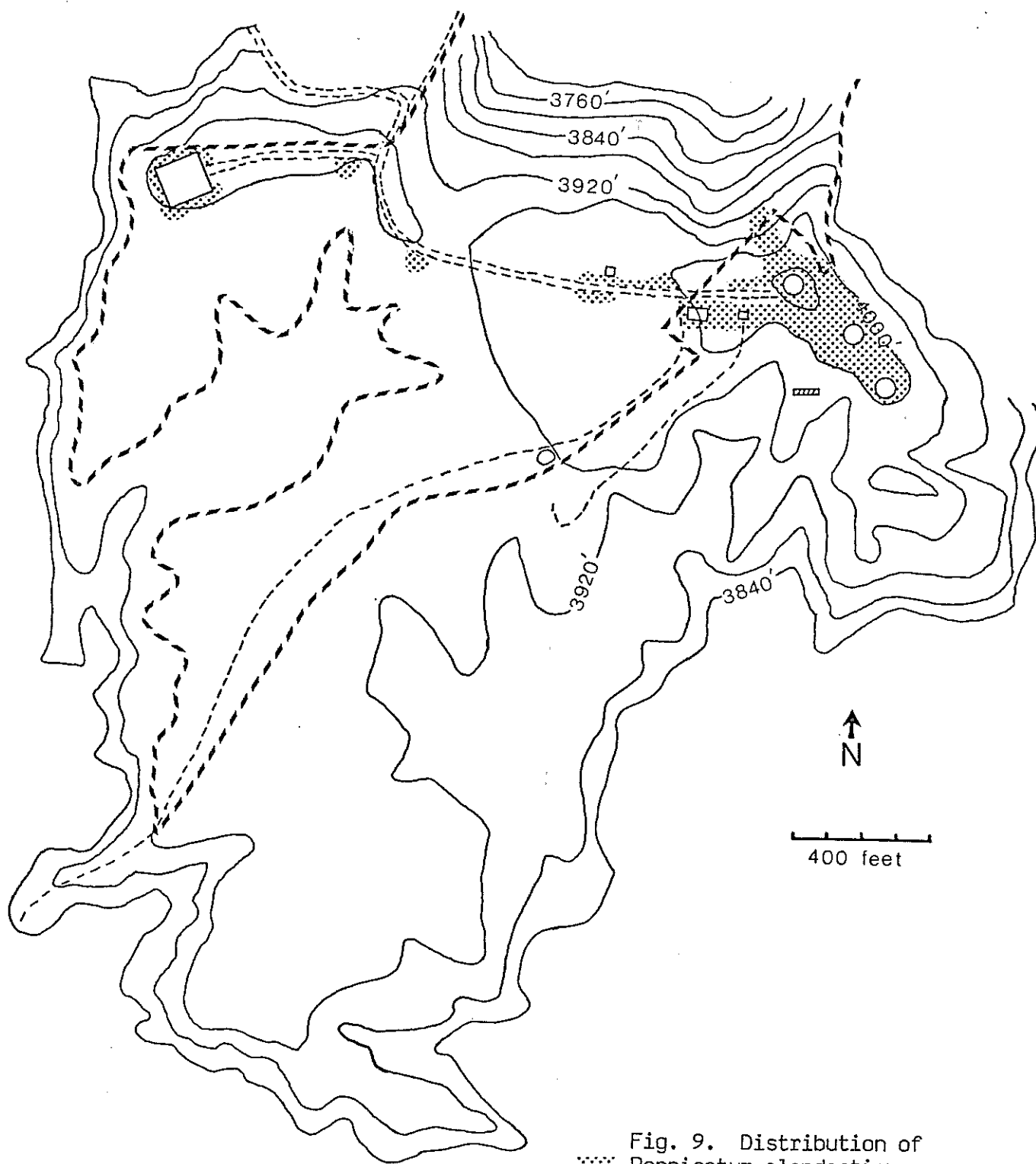


Fig. 9. Distribution of *Pennisetum clandestinum*.

Psidium cattleianum (waiawi)  
MYRTACEAE

Waiawi can be a shrub or small tree up to 24 feet tall. It is a native of Brazil that was introduced to Hawai'i about 1825 (Neal 1965). It proliferates easily from seedy red berries, developing into dense tall thickets in moist areas.

DISTRIBUTION (Fig. 10). There were six populations in pig-damaged areas close to the bog and ridge trails. The total number of plants were 47, of which 2 were 6 feet high, 9 were 3 feet high, and 36 no more than a foot tall.

GENERAL CONDITION. All of the plants displayed vigorous growth. Those that were 3 and 6 feet tall had flower buds and basal suckers.

ACTION TAKEN. The smaller plants were pulled up and larger ones were sawed off at ground level on August 1985.

RECOMMENDATION. The trails and all accessible pig-damaged areas should be regularly monitored. The stumps of cut plants should be treated with herbicide then inspected periodically for sucker regeneration and the reapplication of herbicide.

Rubus penetrans (blackberry)  
ROSACEAE

Blackberry is a thorny thicket-forming shrub that can reach a height of 9 feet. Introduced into the Islands in 1894 for its juicy, seedy berries, by 1960 it became a troublesome weed in native forests (Neal 1965). Blackberry grows well in moist areas above 3,000 feet elevation.

DISTRIBUTION. (Fig. 11). The heaviest concentration of blackberry is in disturbed areas by the helicopter pad and along the road. The following indicates the extent of blackberry infestation in the reserve portion of the summit plateau.

<u>Blackberry Cover</u>	<u>Reserve Area</u>
1-10 %	15.4 acres
11-25	1.8
26-50	0.3
51-100	0.7

Outside the reserve, blackberry occurs in large areas in a gully below the southernmost point of the plateau, on the

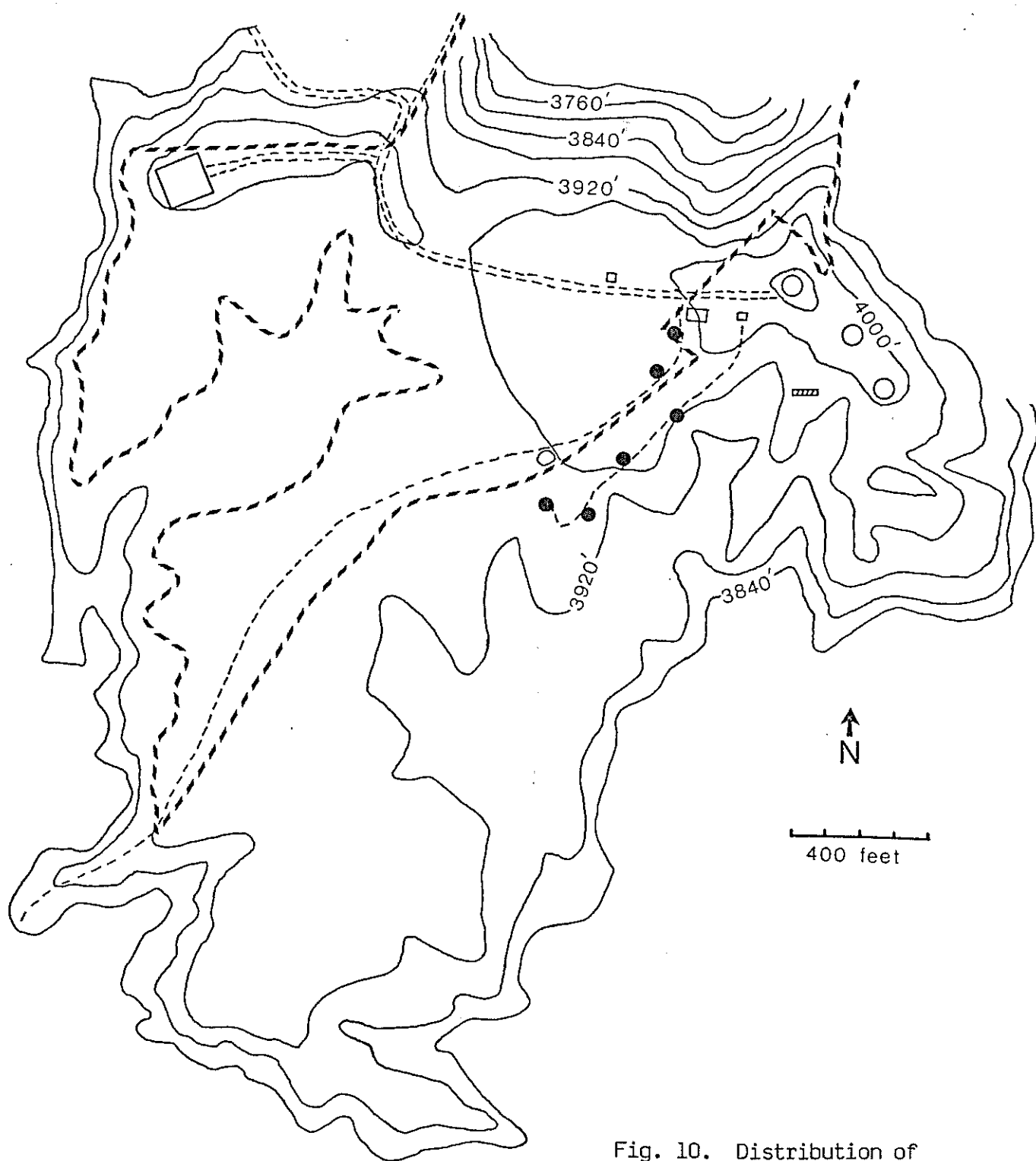


Fig. 10. Distribution of  
● *Psidium cattleianum*.



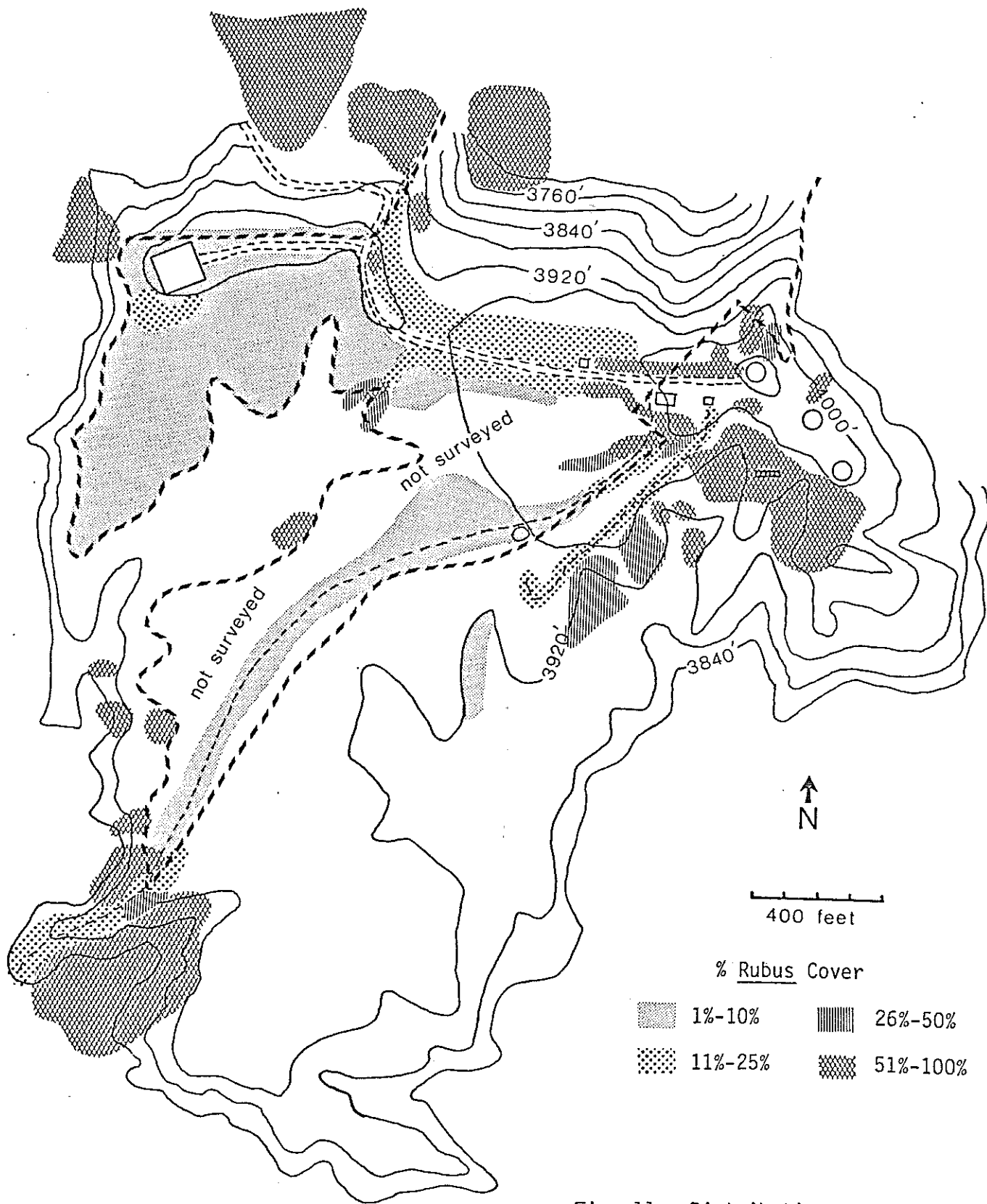


Fig. 11. Distribution of *Rubus penetrans*.

southern slope from the radar dome site, and near the Dupont trail.

GENERAL CONDITION. The well-established blackberry populations are in dense thickets. During the study period, there were heavy flowering and a few fruits. New plants were developing from seedlings and underground stems.

RECOMMENDATION. At present it appears that a combined manual and chemical treatment is the only practical way to cope with the blackberry problem. Three insect species released from 1963 to 1967 for the biological control of blackberry have had negligible effect (Hawai'i Department of Agriculture 1979, Gardner and Davis 1982). Plant pathogens, specifically leaf rusts, are being studied for their potential use as biocontrol agents (Hodges and Gardner 1983).

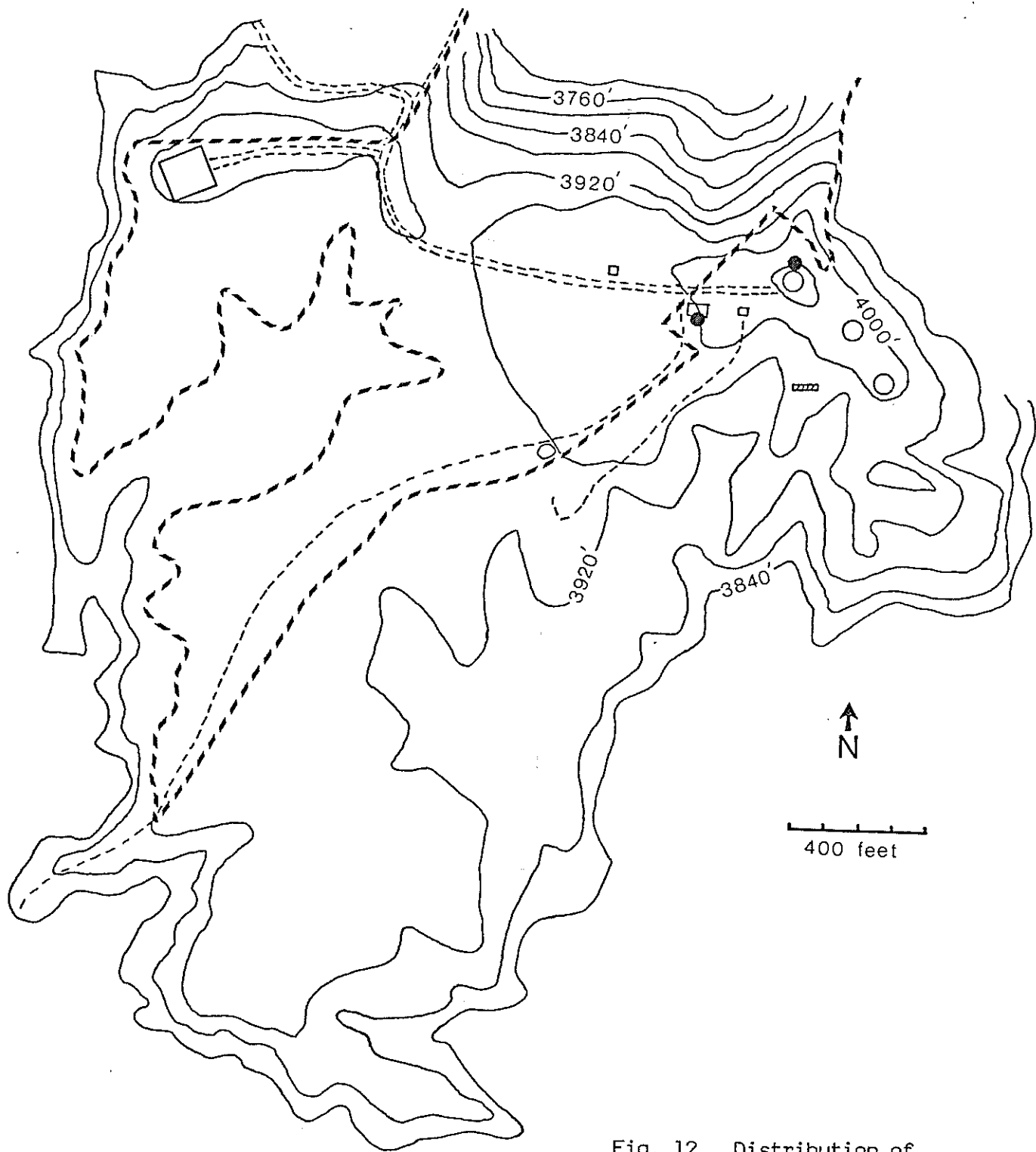
Tritonia crocosmiflora (montbretia)  
IRIDACEAE

This is a perennial herb, 3 to 4 feet tall, with long, slender leaves that develop from a roundish underground stem (corm). New plants develop from subterranean branches. A non-seed bearing, horticultural cross between two African species (Tritonia pottsii and Crocosmia aurea), it was probably introduced into the Hawaiian Islands before 1900 as an ornamental (Degener 1930). It grows well in cool localities.

DISTRIBUTION (Fig 12). Tritonia was not seen within the reserve itself. One population growing in an area of about 9 by 21 feet is in tall kikuyugrass by the helicopter pad. Four smaller patches, each roughly 6 by 6 feet, are on the kikuyugrass lawn next to the first radar dome. These populations undoubtedly originated, accidentally or otherwise, from those cultivated in flower beds at the radar dome facility.

GENERAL CONDITION. There are many young plants, up to 6 inches tall, growing among larger ones, a few of which had flowers. The patches of densely growing Tritonia appear healthy and are probably expanding by creeping subterranean branches.

RECOMMENDATION. The still localized populations should be eradicated. Personnel of the radar dome facility should be informed of the problem of Tritonia being accidentally introduced into the native forest.



● Fig. 12. Distribution of *Tritonia crocosmiflora*.

## SPECIES CHECKLIST

The families are arranged alphabetically under Ferns and Fern Allies, Monocotyledons, and Dicotyledons. The taxonomy and nomenclature are according to Lamoureux (1984) for the Ferns and Fern Allies, and St. John (1973) for most of the Monocotyledons and Dicotyledons. Hawaiian names are as given by Porter (1972).

Each species is recorded with its geographic status and relative frequency in the two vegetation types--wet shrub forest and roadside vegetation--using these symbols:

### Geographic Status

- E, endemic (native only to the Hawaiian Islands)
- I, indigenous (native to the Hawaiian Islands and elsewhere)
- X, nonnative (introduced intentionally or accidentally by man)

### Frequency

- A, abundant
- C, common
- LC, locally common
- O, occasional
- U, uncommon
- R, rare (seen less than five times)
- , absent

	Common Name	Status	Shrub Forest	Roadside Vegetation
<u>FERNS AND FERN ALLIES</u>				
ASPIDIACEAE				
Ctenitis rubiginosa (Brack.) Copel.	pauoa	E	R	R
Dryopteris glabra (Brack.) O. Kuntze	kilau	E	C	U
ASPLENIACEAE				
Asplenium contiguum Kaulf.		E	U	-
ATHYRIACEAE				
Athyrium microphyllum (J. Sm.) Altson	'akolea	E	C	R
BLECHNACEAE				
Blechnum occidentale L.	blechnum fern	X	-	R
Sadleria cyatheoides Kaulf.	'ama'u	E	O	O
DICKSONIACEAE				
Cibotium chamissoi Kaulf.	hapu'u 'i'i	E	O	-
Cibotium glaucum (J. Sm.) Hook. & Arn.	hapu'u	E	O	U
Cibotium splendens (Gaud.) Krajina ex Skottsb.	hapu'u pulu	E	C	U
ELAPHOGLOSSACEAE				
Elaphoglossum alatum Gaud.	'ekaha	E	R	-
Elaphoglossum crassifolium (Gaud.) Anders. & Crosby	'ekaha	E	U	-
Elaphoglossum hirtum var. micans (Mett.) C. Chr.	'ekaha	E	R	-
GLEICHENIACEAE				
Dicranopteris linearis (Burm.) Underw.	uluhe	I	LC	LC
GRAMMITACEAE				
Adenophorus hymenophylloides (Kaulf.) Hook. & Grev.	pai	E	R	-
Adenophorus tamariscinus (Kaulf.) Hook. & Grev.	wahine-noho-mauna	E	O	-
Xiphopteris saffordii (Maxon) Copel.	kihi	E	O	-

	Common Name	Status	Shrub Forest	Roadside Vegetation
HEMIONITIDACEAE				
Pityrogramma calomelanos (L.) Link	gold or silver fern	X	-	R
HYMENOPHYLLACEAE				
Sphaerocionium lanceolatum (Hook. & Arn.) Copel.	palai hinahina	E	C	-
HYPOLEPIDACEAE				
Hypolepis punctata (Thunb.) Mett.		I	U	-
LINDSAEACEAE				
Sphenomeris chinensis (L.) Maxon	pala'a	I	U	O
LYCOPODIACEAE				
Lycopodium cernuum L.	wawae-'iole	I	O	-
Lycopodium venustulum Gaud.	wawae-'iole	I	R	-
NEPHROLEPIDACEAE				
Nephrolepis multiflora (Roxb.) Jarrett ex Morton	swordfern	X	-	R
POLYPODIACEAE				
Pleopeltis thunbergiana Kaulf.	pakahakaha	I	U	-
Polypodium pellucidum Kaulf.	'ae	E	U	R
THELYPTERIDACEAE				
Christella cyatheoides (Kaulf.) Holtt.	kikawaio	E	U	U
Christella dentata (Forsk.) Brownsey & Jermy	downy woodfern	X	-	U
Christella parasitica (L.) Levl.	woodfern	X	R	R
<u>MONOCOTYLEDONS</u>				
COMMELINACEAE				
Commelina diffusa Burm. f.	honohono	X	-	R
CYPERACEAE				
Carex alligata F. Boott	Hawaiian sedge	E	R	-

		Common Name	Status	Shrub Forest	Roadside Vegetation
CYPERACEAE					
Cyperus af. hypochlorus Hbd.			E	U	U
Cyperus laevigatus L.	makaloa		I	R	-
Kyllinga brevifolia Rottb.	kili'o'opu		X	O	O
Kyllinga nemoralis (J.R. & G. Forst) Dandy ex Hutch. & Dalziel	kili'o'opu		X	-	R
Machaerina angustifolia (Gaud.) Koyama	'uki		I	O	R
Pycnus polystachos (Rottb.) Beauv.			I	-	O
GRAMINEAE					
Agrostis avenacea Gmel.	he'u pueo		X	-	R
Agrostis stolonifera L.	marsh bent		X	-	R
Andropogon virginicus L.	broomsedge		X	LC	O
Axonopus affinis Chase	narrow-leaved carpetgrass		X	LC	C
Bromus inermis Leyss.	smooth brome		X	-	R
Cenchrus echinatus L.	common sandbur, 'ume'alu		X	-	R
Cynodon dactylon (L.) Pers.	Bermuda grass, manienie		X	-	O
Dactylois glomerata L.	orchardgrass		X	-	R
Holcus lanatus L.	velvetgrass		X	-	R
Lolium multiflorum Lam.	Italian ryegrass		X	-	R
Melinis minutiflora Beauv.	molasses grass		X	-	O
Paspalum conjugatum Berg.	Hilo grass, mau'u Hilo		X	LC	C
Paspalum urvillei Steud.	Vasey grass		X	-	O
Pennisetum clandestinum Hochst. ex Chiov.	kikuyugrass		X	-	LC
Poa annua L.	annual bluegrass		X	-	U
Polypogon interruptus HBR.	ditch polypon		X	-	R
Rhynchelytrum repens (Willd.) C.E. Hubb.	Natal redtop		X	-	R
Sacciolepis indica (L.) Chase	Glenwood grass		X	O	C
Setaria glauca (L.) Beauv.	yellow foxtail		X	-	U
Sporobolus indicus (L.) R. Br.	West Indian dropseed		X	-	R
Vulpia megalura (Nutt.) Rydb.	foxtail fescue		X	-	R



	Common Name	Status	Shrub Forest	Roadside Vegetation
IRIDACEAE				
Tritonia crocosmiflora Nichols.	montbretia	X	-	U
JUNCACEAE				
Juncus bufonicus L.	common toad rush	X	R	O
Juncus planifolius R. Br.		X	LC	O
LILIACEAE				
Astelia veratroides Gaud.	pa'iniu	E	U	-
Dianella sandwicensis Hook. & Arn.	'uki'uki	E	LC	-
Smilax sandwicensis Kunth	hoi kuahiwi	E	U	-
ORCHIDACEAE				
Anoetochilus sandwicensis Lindl.	'okika honohono	E	R	-
Liparis hawaiiensis Mann	'awapuhi-a-Kanaloa	E	U	-
Spathoglottis plicata Bl.		X	R	-
PANDANACEAE				
Freycinetia aborea Gaud.	'ie'ie	E	U	-
<u>DICOTYLEDONS</u>				
AQUIFOLIACEAE				
Ilex anomala Hook. & Arn.	kawa'u	E	O	-
ARALIACEAE				
Cheirodendron platyphyllum (Hook. & Arn.) Seem.	lapalapa	E	O	-
Cheirodendron trigynum (Gaud.) Heller	olapa	E	U	-
CARYOPHYLLACEAE				
Cerastium vulgatum L.	larger mouse-ear chickweed	X	-	R
Drymaria cordata (L.) Willd. ex R. & S.	pipili	X	-	R
COMPOSITAE				
Acanthospermum australe (Loefl.) Ktze.	spiny bur, star bur	X	-	R

	Common Name	Status	Shrub Forest	Roadside Vegetation
COMPOSITAE				
<i>Bidens</i> sp.	ko'oko'olau	E	U	-
<i>Dubautia laxa</i> var. <i>waianensis</i> Deg. & Sherff	na'ena'e-pua-melemele	E	U	U
<i>Dubautia plantaginea</i> Gaud. var. <i>plantaginea</i>	na'ena'e	E	U	-
<i>Erechtites valerianaefolia</i> (Wolf) DC.		X	U	U
<i>Erigeron bonariensis</i> L.	hairy horseweed, ilioha	X	-	U
<i>Erigeron pusillus</i> Nutt.		X	-	R
<i>Eupatorium adenophorum</i> Spreng.	Maui pa-makani	X	R	O
<i>Eupatorium riparium</i> Regel	Hamakua pa-makani	X	-	R
<i>Gnaphalium peregrinum</i> Fern.		X	-	R
<i>Hypochoeris glabra</i> L.	smooth cats-ear	X	-	R
<i>Taraxacum officinale</i> (L.) Weber	dandelion, lua-lele	X	-	U
<i>Youngia japonica</i> (L.) DC.	oriental hawksbeard	X	-	O
CRUCIFERAE				
<i>Nasturtium microphyllum</i> Boenn. ex Reichenb.	watercress, leko	X	R	U
<i>Nasturtium sarmentosum</i> (DC.) Schinz & Guillaumin	pa'ihī	X	-	U
EPACRIDACEAE				
<i>Styphelia tameiameia</i> (Cham.) F. Muell.	pukiawe	I	C	U
ERICACEAE				
<i>Vaccinium calycinum</i> Sm.	'ohelo-kau-la'au	E	O	R
GENTIANACEAE				
<i>Centaurium erythraea</i> Rafn.	bitter herb	X	-	R
GESNERIACEAE				
<i>Cyrtandra wilderi</i> St. John & Storey		E	U	-
GOODENIACEAE				
<i>Scaevola gaudichaudiana</i> Cham.	naupaka-kuahiwi	E	U	-
<i>Scaevola mollis</i> Hook. & Arn.	naupaka	E	U	U

	Common Name	Status	Shrub Forest	Roadside Vegetation
GUNNERACEAE				
Gunnera kaalensis (Krajina) St. John	'ape'ape	E	R	-
LABIATAE				
Mentha spicata L.	spearmint	X	-	U
Phyllostegia grandiflora (Gaud.) Benth.	kapana	E	R	-
LEGUMINOSAE				
*Leucaena leucocephala (Lam.) de Wit	koa haole	X	-	R
Medicago lupulina L.	black medic	X	-	R
Medicago polymorpha L.	bur clover	X	-	R
LOBELIACEAE				
Trematolobelia macrostachyos (Hook. & Arn.) Zahlbr.	koli'i	E	U	-
LOGANIACEAE				
Buddleja asiatica Lour.	dogtail, huelo-'ilio	X	-	U
Labordia fragraeoidea var. saint-johniana Sherff	kamakahala	E	O	-
Labordia spp.		E	U	-
LORANTHACEAE				
Korthalsella latissima (v. Tiegh.) Danser	hulu-moa	E	O	-
LYTHRACEAE				
Cuphea carthagenensis (Jacq.) Macbride	pua-kamoli	X	-	U
Lythrum maritimum HBK.	pukamole	X	-	R
MELASTOMACEAE				
*Clidemia hirta (L.) D. Don	clidemia, Koster's curse	X	R	-
MYRSINACEAE				
Myrsine lessertiana A. DC.	kolea-lau-nui	E	U	-
Myrsine sandwicensis A. DC.	kolea-lau-li'i	E	C	-

\*Eradicated, see text.

	Common Name	Status	Shrub Forest	Roadside Vegetation
MYRTACEAE				
<i>Eugenia sandwicensis</i> Gray	'ohi'a-ha	E	O	-
* <i>Leptospermum scoparium</i> J.R. & G. Forst.	tea tree, manuka	X	R	R
<i>Metrosideros collina</i> ssp. <i>polymorpha</i> (Gaud.) Rock var. <i>polymorpha</i>	'ohi'a-lehua	E	A	U
<i>Metrosideros collina</i> ssp. <i>polymorpha</i> var. <i>glaberrima</i> (Level.) Rock	'ohi'a-lehua, lehua-hamae	E	A	O
* <i>Psidium cattleianum</i> Sabine	waiawi, strawberry guava	X	U	-
ONAGRACEAE				
<i>Epilobium cinereum</i> A. Rich	willow herb, pu-kamole	X	-	O
PIPERACEAE				
<i>Peperomia lilifolia</i> C. DC.		E	U	-
<i>Peperomia membranacea</i> Hook. & Arn.	'ala'ala-wai-nui	E	O	-
PLANTAGINACEAE				
<i>Plantago major</i> L.	common plantain, lau-kahi	X	-	O
PRIMULACEAE				
<i>Anagallis arvensis</i> L.	scarlet pimpernel	X	-	R
ROSACEAE				
<i>Rubus penetrans</i> Bailey	blackberry	X	LC	LC
<i>Rubus rosaefolius</i> Sm.	thimbleberry	X	-	R
RUBIACEAE				
<i>Coprosma ochracea</i> var. <i>kaalae</i> St. John	pilo	E	C	-
<i>Gouldia terminalis</i> (Hook. & Arn.) Hbd.	manono	E	O	R
<i>Hedyotis schlectendahlana</i> Steud.		E	R	-
<i>Nertera granadensis</i> var. <i>insularis</i> Skottsb.	makole	E	O	-
<i>Psychotria kaduana</i> (C. & S.) Fosb.	kopiko-kea	E	U	-
RUTACEAE				
<i>Pelea clusiaefolia</i> Gray	kukae-moa	E	C	-

\*Eradicated, see text.

	Common Name	Status	Shrub Forest	Roadside Vegetation
RUTACEAE				
Pelea af. oahuensis Levl.	'alani	E	O	-
SAXIFRAGACEAE				
Broussaisia arguta Gaud.	kanawao	E	C	-
SCROPHULARIACEAE				
Veronica arvensis L.	common speedwell	X	-	U
SOLANACEAE				
Solanum nigrum L.	popolo, black nightshade	X	-	R
UMBRELLIFERAE				
Centella asiatica (L.) Urban	Asiatic pennywort, pohe kula	X	-	R
URTICACEAE				
Pipturus oahuensis Skottsb.	mamaki	E	U	-
VERBENACEAE				
Verbena litoralis HBK.	weed verbena, ha'uowi	X	-	R

## LITERATURE CITED

- Degener, O. 1930. Plants of Hawaii National Park illustrative of plants and customs of the South Seas. Braun-Brumfield, Inc., Ann Arbor, Michigan, 1975 reprint.
- Foote, D. E., E. L. Hill, S. Nakamura, F. Stephens. 1972. Soil survey of the islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii. U.S. Dept. of Agr., Soil Conservation Service. 23 pp.
- Fosberg, F. R. and D. Herbst. 1975. Rare and endangered species of Hawaiian vascular plants. *Allertonia* 1(1): 1-72.
- Gardner, D. E. and C. J. Davis. 1982. The prospects for biological control of nonnative plants in Hawaiian National Parks. Cooperative National Park Resources Studies Unit/Univ. of Hawaii. Tech. Report 45, 55 pp.
- Gardner, D. E. and C. S. Hodges. 1983. Leaf rust caused by Kuehneola uredinis on native and nonnative Rubus species in Hawaii. *Plant Disease* 67: 962-963.
- Gardner, D. E. and V. A. D. Kageler. 1983. Glyphosate in the control of kikuyugrass, and its effects on associated native and nonnative plants in Hawaiian National Parks. Cooperative National Park Resources Studies Unit/Univ. of Hawaii. Tech. Report 49, 12 pp.
- Haselwood, E. L. and G. G. Motter. 1966. Handbook of Hawaiian Weeds. Hawaiian Sugar Planters Association, Honolulu.
- Hawaii Department of Agriculture. 1979. Foreign Noxious Weed Survey. Hawaii Dept. of Agriculture, Div. of Plant Industry. Typescript. 130 pp.
- Hosaka, E. Y. 1958. Kikuyu grass in Hawaii. Hawaii Agricultural Experiment Sta. Circ. 389.
- Lamourex, C. H. 1984. Checklist of Hawaiian Pteridophytes. Typescript.
- Neal, M. C. 1965. In Gardens of Hawaii. Rev. ed. Bishop Museum (Honolulu), Special Publ. 50.

Porter, J. R. 1972. Hawaiian names for vascular plants.  
College of Tropical Agriculture, Hawaii Agricultural  
Experimental Sta., Univ. of Hawaii, Dept. Pap. 1.

St. John, H. 1973. List and Summary of the Flowering Plants  
in the Hawaiian Islands. Pacific Tropical Botanical  
Garden (Kauai, Hawaii), Mem. No. 1.